Podcasts in higher education: students' and lecturers' perspectives

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Abstract: This paper reports the use of podcasts in blended-learning at the University of Minho, in Portugal. Six lecturers created their own podcasts with different purposes in order to support their undergraduate and graduate courses and their students' (n=318) learning. The reported study belongs to a broader project about the impact of podcasts in blended-learning and it reports data from two semesters. Results give evidence of students' acceptance regarding podcasts although they do not yet make use of the advantages of media and mobile technologies. The lecturers considered podcasts worthwhile for teaching and for students to learn, but they are time-consuming and there is no institutional recognition. In spite of this, they intend to continue using podcasts in their courses.

Keywords: podcast, higher education, students' reaction, lecturers' reaction, blended-learning

1. Introduction

Podcasts are audio or video files that can be subscribed to and downloaded by users via RSS (Really Simple Sindication). Due to the facility in editing and distributing they have become popular as radio shows (Richardson, 2006) and rapidly evolved to different uses. Some universities were sensitive to the audio power of easy online access and motivated for its use (Boulos et al., 2006; Lane, 2006; Newbutt et al., 2008). For example, at Duke University ipods were offered to freshmen in order to encourage them to listen to podcasts (Belanger, 2005). Research about the use of podcasts is being conducted (Frydenberg, 2006; Lane, 2006; Evans, 2007; Guertin et al., 2007; Carvalho et al., 2008b), integrating projects such as: in Australia at Charles Sturt University (Lee & Chan, 2007), in

the UK through the IMPALA project (Salmon et al., 2007), and in Portugal at the University of Minho (Carvalho et al., 2008b).

Podcasts may be used for different purposes, such as vocabulary revision, listening exercises, interviews with native speakers, key point summaries of a lecture or group of lectures, sharing announcements, describing homework assignment assessment, giving feedback, guidelines, reducing the effects of isolation and promoting inclusivity, developing students' study skills through collaborative learning, providing guidance on student practical work, etc. The most common podcast is a lecture recorded in the classroom. We think that this kind of podcast may be useful for an absent student but it is too long and has a lot of background noise. Lane (2006) reported that students found it difficult to hear questions and discussions on the podcasts, thus they required visual aids. Podcasts were limited to how much of classroom experience they could capture.

The reported study describes the results achieved at the University of Minho, during two semesters, and describes students' reaction to the podcasts used in their courses and lecturers' opinions about podcast creation and its benefits towards the learning process. Besides focusing on the advantages of audio, we propose a podcast taxonomy based on the following variables: type, medium, length, author, style and purpose.

2. Podcasts in Higher Education

Most of the studies about podcasts use audio files (Lee & Chan, 2007; Salmon et al., 2007; Carvalho et al., 2008a, b) but some also use video files particularly in veterinary education and GIS Software (Salmon et al., 2007), microbiology and biochemistry (Watson & Boggs, 2008). Video podcasts may also be named vodcasts or vidcasts. The screencast, a new category that is a screen capture with audio (Newbutt et al., 2008), is particularly useful for demonstrating a task or tutorial on a computer screen.

Some authors claim that it is a renaissance of audio for learning (Salmon & Edirisingha, 2008) or of the power of audio.

Students at the University of Washington found the audio records (of lectures) helpful when preparing for homework or exams (Lane, 2006). Students used podcasts as study aids, to clarify materials covered in lectures, thus enhancing their comprehension of complex concepts or to fill in gaps in their notes.

Kaplan-Leiserson (2005) and Lane (2006) propose to consider podcasts as a way to change classroom practices. Students can listen to a lecture via podcast before class and the lecturer can devote part of class time to other activities.

2.1. The power of audio

Durbridge (1984) emphasises the pedagogical advantages of audio compared to printed media, stating that the spoken word can influence both cognition (adding clarity and meaning) and motivation (by conveying directly sense to the person creating those words). On the other hand, voice is personal and the frequencies of the human voice allow to adjust intonation, inflexion, phrasing, pacing, volume, loudness and timbre (Power, 1990 in Lee & Chan, 2007). Students like to hear their lecturers´ voice (Durbridge, 1984; Richardson, 2006; Salmon et al., 2007; Carvalho et al, 2008b).

The Scottish Council for Educational Technology (1994) reports that audio is a powerful medium for conveying feelings, attitudes and atmosphere. However, it is less effective at conveying detail and facts if listened to for more than 30 minutes.

Audio is a great way to deliver information, especially for auditory learners (Kaplan-Leiserson, 2005; Williams, 2007). The ability to stop, start and replay also makes it appropriate for students with special needs or challenges.

2.1.1 Podcasts length

The podcast length must be related to its content and purpose. However, Cebeci and Tekdal (2006) recommend podcasts no longer than 15 minutes, because there is generally a loss of attention in listening and a decrease in comprehension after this period of time. Lee and Chan (2007) created podcasts that were structured as talkback radio-style segments of 3 to 5 minutes. In the IMPALA project most of the podcasts lasted 10 minutes (Salmon et al., 2007). Walch and Lafferty (2006) stated that a 10 minute podcast full of information that is quick and snappy is far more enjoyable than a 30 minute show with only 11 minutes of material.

Based on a literature review, we may conclude that the recommendations point to a short length (Frydenberg, 2006; Lee & Chang, 2007; Salmon et al., 2007): 3 to 5 minutes podcasts (Lee & Chang, 2007) or 10 minutes (Salmon et al., 2007).

We classify podcast length as short (1-5 minutes), moderate (6-15 minutes) and long (more than 15minutes).

2.1.2 Podcast recommendations

A podcast should have technical quality. It is important to avoid background noise, tinny-sounding, and verbal mistakes that interrupt the flow of the podcast. To develop a good vocal technique it is important that the speaker is relaxed (Walch & Lafferty, 2006). It is also important that a certain level of energy is maintained so that listeners remain engaged.

The podcast should have a beginning, a middle and an end. For example, Fothergill in his module of Optical Fibre Communication Systems used podcasts with the following structure: news, announcements, feedback and a fun ending (joke or rap) (Edirisingha et al., 2007). It is important to plan the content and "flow" of the podcast. When using music it should match the podcast's style and

spirit (Williams, 2007). Lee and Chan (2007) recommend keeping podcasts short, lively and entertaining.

3. Podcast taxonomy

Podcasts are used in education with different purposes (Evans, 2007; Lee & Chan, 2007, Salmon et al., 2007), making a podcast taxonomy in teaching and learning useful and necessary.

Salmon et al. (2007) created a classification of podcasts which they stated as "a transferable model of podcasting". This model has ten variables: Purpose, Convergence, Developer, Medium, Reusability, Structure, Length, Style, Capacity, and Frequency.

We agree with most of the listed variables but we did not feel comfortable with this model of classification. Particularly the words and the categories chosen for podcast Structure (single or multiple sessions) and Capacity (large student cohorts or small groups of students) do not seem appropriate to characterize the number of sessions or the target audience. Moreover, the role of students as producers of podcasts is either included in the purpose or in developer categories. We think that it is important to have the general type of podcast and then its purpose among other variables.

We are developing a podcast taxonomy that is based on a literature review and takes in consideration the following assumptions: podcasts are not used in classroom; podcasts are not lectures recorded in the class during face-to-face sessions; podcasts should be reusable although some types, such as those giving feedback, for instance, are not. The taxonomy has six variables, as follows:

[1] *Type*: we consider four types of podcasts - Informative (concepts, analysis, synthesis, reading of texts, poems, description of tools or equipments, etc.); Feedback/ Comments (to students assignments and group work); Guidelines (to field work and to practical work); and Authentic Materials, such as interviews, reports, news, and so on.

[2] *Medium*: Audio or Video (including screencast).

[3] *Length*: Short (1'-5'), Moderate (6'-15') or Long (>15').

[4] *Author*: Lecturer, Student, and other (experts, local community, and representatives).

[5] *Style*: Formal or Informal.

[6] *Purpose*: described as an action verb (inform, analyze, develop, motivate, etc.).

4. Research

This research describes the results of a study conducted at University of Minho, in Portugal, focusing the use of podcasts and its implications for learning in higher education. The project goals are the identification of podcasts types used by team members, the evaluation of students' acceptance to podcasts and the analysis of teachers' reactions to the integration of podcasts in blended-learning.

A total of 56 podcasts, of variable length and different purposes, were created during the first and second semesters of 2007/ 2008. The study integrated 6 lecturers and 318 students - 253 undergraduate and 65 masters - enrolled in 13 courses.

4.1 Data Collection Instruments

Data was collected by two questionnaires. A Digital Literacy Questionnaire (DLQ) was filled in by students at the beginning of each course and was set to characterize students' knowledge and uses of Web 2.0 tools. The second questionnaire - an Opinion Questionnaire (OQ) – was filled in at the end of the semester to inquire students' reaction to the use of podcasts.

Lecturers wrote a Teacher Diary of Podcasting and were interviewed at the end of each study.

4.2 Sample characterization

4.2.1 Students and courses

The study involved 318 students, the majority of them female (65%) (Table 1). Only in the courses of Operational Systems (OS) and Usability Assessment (UA) males were overrepresented, with respectively 77% and 62%.

The 253 undergraduate students were enrolled in 8 courses belonging to different programs such as Biology (3), Engineering (1), Sciences Communication (1), Applied Linguistics (1) and Education Sciences (2), and almost all of the 65 graduated students were teachers enrolled in 5 Master courses, of Education (4) and of Digital Art (1) (Table 1).

Table 1. Students enrolled in the study and respective courses

Cycle	Program	Courses	Students		
			Female	Male	Total
Undergraduate	Portuguese Studies	Conversational Analyses (CA)	6	0	6
	Education	Multimedia Educational Materials (MEM)	14	0	14
		Technology & Educational Communication (TEC)	23	0	23
	Applied Biology	Heredity and Evolution (HE-AB)	29	18	47
		Genes and Genomes (GG)	29	18	47
	Biology and Geology	Heredity and Evolution (HE- BG)	20	10	30
	Computer Science	Operational Systems (OS)	10	33	43
	Sciences Communication	Research Methods (RM)	31	12	43
Master	Educational Technology	Multimedia Systems (MS)	16	9	25
	Pedagogical Supervision	Education and Multimedia (EM)	7	3	10
	Technologies and Digital Art	Usability Assessment (UA)	5	8	13
	Adults Education & Communitarian Intervention	Learning and Social Network (LSN)	10	1	11
	Educational Mediation and Supervision	Groups' Dynamics and Leadership (GDL)	6	0	6

4.2.2 Mobile technologies owned and used by students

Besides studying in a wireless university *campus*, Internet access at home is a facility for the great majority of students, no matter if they are from undergraduate (82%) or master (91%) study cycles.

The majority of students (96%) owned a laptop and/ or a desktop computer, 66% had a MP3 player, 11% had a MP4 and 42% also had 3G mobile phones.

Despite having the necessary technology to listen to podcasts, whenever and wherever wanted, students preferred to use their personal computer when listening to their courses podcasts (64%), an option also found by other authors (Lane, 2006; Salmon et al., 2007). Actually, only 1 student from Operational Systems (OS) course, 3 from Education and Multimedia (EM) and 4 from Groups' Dynamics and Leadership (GDL) courses used their 3G mobile phone to listen to podcasts. The popular MP3 mobile device, owned by great part of the students, seems to be preferably used for leisure and not in this learning context, except for all GDL students (6), 4 EM students and 2 OS students.

4.2.3 Podcasts characterization: type and length

A total of 56 podcasts were created (35 for undergraduate programs and 21 for the master courses), varying in type, purpose and length for each course and lecturer (Table 2).

Table 2. Podcasts characteristics: type and length

			Podcasts		
Cycle	Lecturer	Course	Number	Type	Length (minutes)
Undergraduate	A	CA	7	- Informative (exercise of orthographic transcription, course content) - Guidelines (for individual paperwork)	1'04''- 9'42''
	B	MEM	1	- Informative (Instructions for using the Blackboard forum)	1'17''
	C	HE-AB	4	- Informative (Learning outcomes)	0'45''- 1'
		GG	6		1'- 3'
		HE-BG	8	- Informative (Course content, extra contents) - Feedback (to students assignments)	1'27''-7'06''
	D	OS	1	- Informative (Course content)	15'5''
	E	TEC	7	- Informative (course assignments; books excerpts) - Guidelines (for team work assignment)	0'59'-'3'01''
	F	RM	1	- Authentic Material (interview)	37'
Master	B	MS	4	- Feedback (group presentation, students assignments) - Informative (orientation for the session)	1'08''-5'15''
		EM	9	- Informative (instructions to analyze multimedia software or e-games) - Guidelines (for report assignment, to individual assignments) - Feedback (to personal websites)	1'01''–3'09''
		UA	2	- Feedback (about students assignment) - Guidelines (for paper review assignment)	0'36'-'1'57''
	E	LSN	3	- Informative (course assignements, course content, books excerpts) - Guidelines (for team work assignment)	0'59''-3'01''
	F	GDL	3	- Informative (course content)	1'53'–22'

According to the podcasts taxonomy proposed, all types (Informative, Guidelines, Feedback and Authentic Materials) were used, and 4 of the podcasts were long but the majority was short, as recommended by several studies (Cebeci & Tekdal, 2006; Frydenberg, 2006; Lee & Chan, 2007; Salmon et al., 2007). All podcasts were audio files, mainly of formal style and covering different purposes (inform, analyze, develop, motivate, explain, comment, assess) and all were created by lecturers, except the interview.

4.3 Students' reaction to podcasts

4.3.1 Podcast listening and podcast quality

The majority of students stated to be unfamiliar with podcasts whether they are undergraduate (57%) or master students (57%). The few exceptions belonged to OS (Operational Systems, 88%), MS (Multimedia Systems, 60%), UA (Usability Assessment, 54%) and HE-AB (Heredity and Evolution of Applied Biology, 53%) students who knew what a podcast was.

The majority of students listened to the podcasts delivered by their lecturers (Figure 1). GG students were the less receptive to the listening of the audio files,

probably because they also had access to the podcasts content in a written format, which they asked for, though given after the delivery of the audio file.

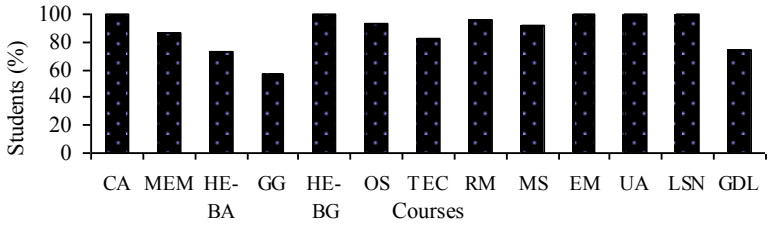

Figure 1. Students listening to podcasts

When analyzing the defined podcast quality parameters, students pointed its audibility and referred, almost without exception, that they had clear information and a friendly voice (Table 3). These results seem to illustrate that students liked to hear their lecturers´ voices. In the interview, some of them mentioned that they felt a sensation of proximity with their lecturers. Again these results are in accordance with several authors´ conclusions (Durbridge, 1984; Richardson, 2006; Salmon et al., 2007) about the power of spoken word and the human voice in podcasting.

However, 60% of the students from Groups' Dynamics and Leadership (GDL) and 56% of the students enrolled in Research Methods (RM) found podcasts too long but these were precisely the courses with the longer podcasts (Table 2), once again reinforcing the importance of keeping podcasts short.

Table 3. Podcasts quality (%)

Cycle	Lecturers	Course	Podcasts quality (%)			
			Audible	Friendly voice	Too long	Clear information
Undergraduate	A	CA	100	100	17	100
	B	MEM	100	100	0	100
	C	HE-AB	100	100	8	100
		GG	100	85	22	78
		HE- BG	97	93	13	93
	D	OS	93	95	15	88
	E	TEC	100	95	5	100
	F	RM	98	76	56	80
Master	B	MS	100	100	0	100
		EM	100	100	0	100
		UA	77	77	8	77
	E	LSN	91	73	0	73
	F	GDL	100	80	60	80

4.4. Lecturers' perspectives on the use of Podcasts

This study integrated 6 lecturers from different Schools (Humanities, Social Sciences, Sciences and Engineering, one from each, and 2 from Education), 1 male and 5 female, ranging in their forties.

All the lecturers had a very good impression about the use of podcasts and they recognised the potential of this pedagogical resource. However, creating podcasts and using podcasts in an effective way is a difficult and time-consuming task, which may limit its implementation. Table 4 synthesises the opinions of the lecturers concerning their experience using podcasts.

Table 4. Lecturers' perspectives on the use of podcasts

Parameters	Categories	(n=6)	
		f	%
Acceptance	- very positive	6	100
Planning	- write the podcast text and read (rehearsal)	6	100
	- live recording (no rehearsal)	1	17
	- reading a text (from a book)	2	33
	- podcasts already available	1	17
Advantages	- pedagogical novelty (students' motivation)	6	100
	- availability and flexibility (anywhere and everywhere)	6	100
	- effective in delivering course content, information, guidelines, feedback, etc	2	33
Constraints	- time-consuming	6	100
	- lack of institutional recognition	6	100
	- ICT students´ literacy (lack of familiarization)	1	17

Using podcasts as a pedagogical resource was considered by all lecturers a very positive experience. Podcasts were perceived as a very useful and powerful strategy for improving classes and motivating students, regardless of the type of podcast implemented and of the specific course.

Regarding podcast planning, most of the teachers preferred to write the podcast text. Most of them referred to the necessity of rehearsing the podcast in order to make it more clear and effective. This leads to one of the recognized difficulties of podcasting: the time required for its production. There are some exceptions, for example: lecturer A recorded a live speech (intentionally, for students to practice orthographic transcription); lecturer F used an available interview; and lecturer E read excerpts from books.

Lecturers considered podcasts worthwhile, mainly because they see them as an opportunity for pedagogical innovation, which can positively influence students' motivation. Besides this advantage, podcasts are permanently available allowing students to listen to their content at any time, whenever they need or want it.

Podcasts may also provide extra material related to the course or even course contents, giving time for the development of other pedagogical activities in class.

However, all lecturers pointed out that producing podcasts is a very time-consuming task. The information to be read must be carefully chosen and rehearsed in order to achieve the aimed result. Then it is necessary to create the

record conditions, including a soundproof and isolated environment. Moreover, it is necessary to become familiar with the required software which, despite not being very complex, is not that simple and is not error free.

Most of the lecturers also mentioned that the time spent and the effort made are not recognized by the institution.

Despite the drawbacks identified, lecturers plan to continue using podcasts, introducing modifications to the process, trying to minimize the required production time, and enlarging the experience to other contents and other podcast types. Reusability seems to be a key issue in recovering from the effort made.

5. Conclusion

Podcasts are being used in higher education. Lecturers are using them with different purposes and applying different production approaches. They considered the introduction of podcasts in their courses a very positive experience, as they are an effective tool in delivering content, feedback, guidelines, etc. Most of the students accepted quite well the podcasts, but they did not take the advantage of listening to them in their mobile devices.

Lecturers considered that podcast production is time-consuming and there is a lack of institutional recognition of their teaching effort. However, they intend to continue using podcasts in their courses.

Due to the positive results achieved, a study in a distance learning course will be conducted to analyze the effect of podcast types (informative, guidelines and feedback) in students' motivation to task achievement.

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